

APPENDIX B

COMMUNICATION WITH USEPA

Andy Martin

Subject: FW: Gulfport Turning Basin - Tissue Chemistry

From: Andy Martin
Sent: Monday, February 04, 2013 11:34 AM
To: Johnson.Doug@epamail.epa.gov
Cc: Wendell Mears
Subject: Gulfport Turning Basin - Tissue Chemistry

Doug,

Thank you for your time today. As Shelly mentioned, we really appreciated the opportunity to retest the amphipods using the modified feeding methods. As you can see, the results were positive and confirms a chemical contaminant was not responsible for the initial low survival counts.

Moving forward, please confirm our understanding of the required analytical tissue chemistry:

- % lipids – all samples
- Metals – all samples
- PAHs – Samples GP-DU2-COMP, GP-DU3-COMP, GP-DU6-COMP, GP-DU7-COMP, RS-GP-C
- PCB Congeners – Samples GP-DU7-COMP, RS-PAS-A

Thank you,

Andrew

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MEMORANDUM

To: Doug Johnson, USEPA Region 4 **Date:** January 11, 2013

From: Andrew Martin, Shelly Anghera, and Wendell Mears, Anchor QEA **Project:**

Cc: Elizabeth Calvit, Program Managers Office,
Mississippi State Port Authority at Gulfport

Re: Gulfport Turning Basin – Preliminary Chemistry and Bioassay Test Results

INTRODUCTION

Since the completion of field sampling activities as part of the Gulfport Turning Basin dredged material characterization, Anchor QEA has been overseeing and coordinating the contract laboratories as samples continue to be tested and analyzed. Preliminary bulk sediment chemistry and bioassay test results have recently been received. The preliminary results from the amphipod bioassay laboratory demonstrate reduced survivorship of amphipods in four dredge units (DUs). When considering other bioassay test and sediment chemistry results, Anchor QEA does not believe the observed toxicity is related to a chemical or suite of chemicals; rather, Anchor QEA believes physical impacts related to grain size and low total organic carbon (TOC) have confounded the amphipod test results.

SUMMARY OF PRELIMINARY RESULTS

Chemistry

Table 1 presents preliminary (unvalidated) sediment chemistry results. A quick overview of the data shows that the majority of analytes are below detectable concentrations, with only metals being consistently detected at low levels. Key observations include the following:

- **Grain size:** Sediment was predominantly a silty clay with sand.
 - **TOC:** Sediment contained less than 1% TOC in all samples except one reference site.
 - **Metals:** No effects range median (ERM) exceedance. All project samples contained metals concentrations at or below reference sediment values. Arsenic concentrations were slightly above effects range low (ERL) values for all samples. Nickel was also slightly above ERL for two project samples and for both reference site samples.
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- **Polycyclic aromatic hydrocarbons (PAHs):** Typically non-detect in all project and reference samples. A few detections of individual analytes (specifically, 2-methylnaphthalene and naphthalene) at concentrations greater than ERL or ERM values, but total PAHs less than the corresponding ERL value in all samples.
- **Organochlorine pesticides:** No ERL or ERM exceedances. All non-detect.
- **Polychlorinated biphenyls (PCBs):** No ERL or ERM exceedances. A few detections at concentrations estimated below the reporting limit.
- **Oranotins:** All non-detect.

Bioassay

Preliminary bioassay test results are presented in Table 2.

Solid Phase – Amphipod

Solid phase (SP) results for the amphipod indicate that several samples exhibited reduced survivorship and one reference site sample did not meet the minimum test survival requirement of at least 73%. Table 3 presents the preliminary amphipod test data. The mean amphipod survival in project samples GP-DU1, GP-DU4, GP-DU8, and GP-DU10 exhibited greater than a 20% difference from the reference site (RS-GP-C, or the Gulfport ODMDS reference site was used for comparison) and was significantly different than reference. Sediment from the Pascagoula ODMDS reference site had a survival rate of 71%, which did not meet the test requirements.

Solid Phase – Polychaete

SP results for the polychaete indicate survival ranged from 94 to 100%, with all test sediment within 10% of reference values.

Suspended Particulate Phase – All species

Suspended particulate phase (SPP) results for the bivalve, mysid shrimp, and juvenile fish all indicate a median lethal concentration (LC₅₀) greater than 100%.

Bioaccumulation Testing

All DUs are currently being evaluated for bioaccumulation potential. The 28-day exposures are expected to end on February 3, 2013.

DISCUSSION

No contaminants of concern are believed to explain the reduced amphipod survival. The relatively high clay content and low TOC concentrations may be impacting amphipod survival. In a study conducted by DeWitt et al. (1997), significantly decreased survival of *Leptocheirus* sp. was observed in sediments containing less than 1% TOC. Similar reduced survivorship rates in low TOC sediment samples were found in Casotte Landing Liquefied Natural Gas (LNG) dredged material investigations (Weston Solutions 2006). A special study was conducted as part of the Casotte Landing LNG (a turning basin adjacent to the Bayou Casotte Federal Navigation Channel in Pascagoula, Mississippi), where amphipods were fed during the 10-day exposures, resulting in increased survivorship and ocean disposal suitability determination. It should be noted that the Casotte Landing LNG project consisted of similar dredged materials as the proposed Gulfport Turning Basin project.

PROPOSED APPROACH

Anchor QEA is requesting your review of the preliminary results and consideration for determination of suitability for ocean disposal despite the reduced survival in the solid phase amphipod test. To provide the necessary evidence needed to allow for the determination of ocean disposal suitability, we propose the following.

- Continue with bioaccumulation potential testing and expand the analytical analysis to include PCBs, pesticides, and PAHs for DU 1, DU 4, DU 8, and DU 10 to provide further evidence of lack of potential for chemical-mediated impacts related to ocean disposed materials.
- Sufficient sediment remains for DU 1, DU 4, and DU 8 (only four replicate chambers) for the rerun of one amphipod test. Anchor QEA proposes to rerun the amphipod 10-day mortality test for these project sediment samples with a modified method to include organism feeding. The feeding regime will be based on that used in the 28-day *Leptocheirus* Chronic test developed by EPA (200 I). On test days 0 and 5, a slurry of ground TetraMin® flakes in seawater will be introduced to each of the fed treatments at a rate of 40 milligrams per chamber per day.

Anchor QEA requests that ocean disposal suitability be considered for DU 1, DU 4, DU 8, and DU 10 if bioaccumulation findings support the lack of accumulation of organic

contaminants in tissues at levels of concern and if retesting of DU 1, DU 4, and DU 8 sediment with feeding suggests that food may be the confounding factor in interpreting the 10-day amphipod test.

REFERENCES

DeWitt, T.H., M.R Pinza, L.A. Niewolny, V.I. Cullinan, and B.D. Gruendell, 1997.

Development and evaluation of standard marine/estuarine chronic sediment toxicity test method using *Leptocheirus plumulosus*. Prepared for the USEPA. PNNL-11768.

Weston Solutions, 2006. Sediment Evaluation for the Proposed Casotte Landing LNG Terminal: Amphipod Testing Study. Prepared for ENSR/AECOM.

Table 1
Preliminary Sediment Chemistry Results – Gulfport Turning Basin

Task			TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012		
Location ID			GP-DU1-COMP	GP-DU2-COMP	GP-DU3-COMP	GP-DU4-COMP	GP-DU5-COMP	GP-DU6-COMP	GP-DU7-COMP	GP-DU8-COMP	GP-DU9-COMP	GP-DU10-COMP	GP-DU10-COMP	RS-GP-C	RS-PAS-A		
Sample ID			GP-DU1-COMP	GP-DU2-COMP	GP-DU3-COMP	GP-DU4-COMP	GP-DU5-COMP	GP-DU6-COMP	GP-DU7-COMP	GP-DU8-COMP	GP-DU9-COMP	GP-DU10-COMP	GP-DU10-COMP-A	RS-GP-C	RS-PAS-A		
Sample Date			12/1/2012	11/30/2012	11/30/2012	11/29/2012	11/28/2012	11/27/2012	11/28/2012	11/26/2012	11/25/2012	11/24/2012	11/24/2012	11/30/2012	11/30/2012		
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N	N		
X			Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	979956.2884	1010059.425		
Y			Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	218163.4691	249291.1779		
ERL			ERM														
Conventional Parameters (unitless)																	
Specific gravity			--	--	1.4091	1.4531	1.514	1.3491	1.357	1.3924	1.3935	1.469	1.3817	1.5062	1.4304	1.2843	1.3097
Conventional Parameters (pct)																	
Total organic carbon			--	--	0.55	0.45	0.44	0.72	0.76	0.62	0.65	0.68	0.68	0.63	--	0.9	1.4
Total solids			--	--	49	52	56	44	43	46	45	52	44	54	48	36	32
Conventional Parameters (su)																	
pH			--	--	8.52	8.56	8.64	8.96	9	8.92	8.96	9.09	9.08	8.88	--	8.83	8.55
Grain Size (pct)																	
Gravel			--	--	0	0	0	0	0	0	0	0	0	0	--	0	0
Sand			--	--	36.4	42.3	46.1	6.2	2.8	17.3	10.6	27.1	10.6	57.3	--	2.7	5.7
Silt			--	--	17.6	21.7	18.1	24.4	25.2	26.7	21.9	30.3	28	13.5	--	28.6	44.6
Clay			--	--	46	36	35.8	69.4	72	56	67.5	42.6	61.4	29.2	--	68.7	49.7
Metals (mg/kg)																	
Arsenic			8.2	70	9.8	8.9	8.9	15	14	12	13	9.7	13	8.7	11	9.2	15
Cadmium			1.2	9.6	0.25 U	0.24 U	0.3 U	0.33 U	0.29 U	0.38 U	0.39 U	0.38 U	0.38 U	0.24 U	0.33 U	0.34 U	0.52 U
Chromium			81	370	22	19	20	39	41	38	39	28	38	22	31	37	47
Copper			34	270	6.8	6.6	6.1	9.8	11	9.7	11	7.9	11	6.6	9.6	22	15
Lead			46.7	218	12	10	9.7	15	16	14	15	12	17	9.7	14	18	20
Mercury			0.15	0.71	0.025	0.024	0.025	0.014 U	0.029	0.025	0.029	0.023	0.03	0.019	--	0.045	0.066
Nickel			20.9	51.6	9.1	10	9.2	18	21	18	20	15	21	12	17	30	23
Selenium			--	--	0.72	0.42 J	0.35 J	0.68 J	0.82	0.76 J	0.59 J	0.71 J	0.79 J	0.51 J	0.69 J	0.79 J	0.95 J
Silver			1	3.7	0.041 J	0.042 J	0.031 J	0.062 J	0.068 J	0.05 J	0.061 J	0.043 J	0.063 J	0.038 J	0.027 J	0.097 J	0.028 J
Zinc			150	410	41	39	35	66	74	66	70	52	72	42	62	100	93
Organometallic Compounds (µg/kg)																	
Butyltin (n-Butyltin)			--	--	10 U	9.4 U	8.9 U	11 U	12 U	11 U	11 U	9.5 U	11 U	9.1 U	--	14 U	15 U
Dibutyltin			--	--	0.8 U	0.76 U	0.71 U	0.91 U	0.92 U	0.86 U	0.88 U	0.76 U	0.92 U	0.73 U	--	1.1 U	1.2 U
Tributyltin			--	--	1.3 U	1.3 U	1.2 U	1.5 U	1.5 U	1.4 U	1.5 U	1.3 U	1.5 U	1.2 U	--	1.8 U	2.1 U
Semivolatile Organics (µg/kg)																	
Hexachlorobenzene			--	--	1.8 U	1.7 U	1.6 U	2 U	2.1 U	2 U	2 U	1.7 U	2 U	1.7 U	--	2.5 U	2.8 U
Pentachlorophenol			--	--	150 U	140 U	130 U	160 U	170 U	160 U	160 U	140 U	170 U	130 U	--	200 U	230 U
Polycyclic Aromatic Hydrocarbons (µg/kg)																	
1-Methylnaphthalene			--	--	7 U	950	120	7.7 U	7.9 U	330	270	6.6 U	7.8 U	6.3 U	--	770	11 U
2-Methylnaphthalene			70	670	7.8 U	1600	200	8.7 U	8.8 U	580	500	7.3 U	8.7 U	7.1 U	--	1400	12 U
Acenaphthene			16	500	13 U	12 U	11 U	14 U	14 U	14 U	14 U	12 U	14 U	12 U	--	17 U*	20 U*
Acenaphthylene			44	640	7.4 U	7 U	6.5 U	8.2 U	8.4 U	7.9 U	8.1 U	6.9 U	8.3 U	6.7 U	--	10 U	11 U
Anthracene			85.3	1100	18 U	17 U	16 U	20 U	20 U	19 U	20 U	17 U	20 U	16 U	--	24 U	28 U
Benzo(a)anthracene			261	1600	8.6 U	8.1 U	7.5 U	9.6 U	9.8 U	9.2 U	9.4 U	8.1 U	9.7 U	7.8 U	--	12 U	13 U
Benzo(a)pyrene			430	1600	13 U	12 U	11 U	15 U	15 U	14 U	14 U	12 U	15 U	12 U	--	18 U	20 U
Benzo(b)fluoranthene			--	--	12 U	11 U	10 U	13 U	13 U	12 U	13 U	11 U	13 U	10 U	--	16 U	18 U
Benzo(g,h,i)perylene			--	--	10 U	9.7 U	9 U	11 U	12 U	11 U	11 U	9.6 U	11 U	9.3 U	--	14 U	16 U
Benzo(k)fluoranthene			--	--	11 U	10 U	9.3 U	12 U	12 U	11 U	12 U	10 U	12 U	9.7 U	--	14 U	16 U
Chrysene			384	2800	7.8 U	7.3 U	6.8 U	8.7 U	8.8 U	8.3 U	8.5 U	7.3 U	8.7 U	7.1 U	--	11 U	12 U
Dibenzo(a,h)anthracene			63.4	260	17 U	16 U	15 U	19 U	19 U	18 U	18 U	16 U	19 U	15 U	--	23 U	26 U
Fluoranthene			600	5100	7.4 U	7 U	6.5 U	8.2 U	8.4 U	7.9 U	8.1 U	6.9 U	8.3 U	6.7 U	--	10 U	11 U
Fluorene			19	540	12 U	11 U	10 U	13 U	13 U	12 U	13 U	11 U	13 U	10 U	--	16 U	18 U
Indeno(1,2,3-c,d)pyrene			--	--	12 U	12 U	11 U	14 U	14 U	13 U	13 U	12 U	14 U	11 U	--	17 U	19 U
Naphthalene			160	2100	14 U	2200	150	15 U	16 U	670	610	13 U	16 U	13 U	--	1600	21 U
Phenanthrene			240	1500	9.1 U	8.5 U	7.9 U	10 U	10 U	9.6 U	9.9 U	8.5 U	10 U	8.2 U	--	12 U	14 U
Pyrene			665	2600	7.4 J	6.6 U	6.1 U	7.7 U	7.9 U	7.5 U	7.6 U	6.6 U	7.8 U	6.3 U	--	9.4 U	11 U
Total PAH (17) (U = 0)			4022	44792	7.4 J	3800	350	20 U	20 U	1250	1110	17 U	20 U	16 U	--	3000	28 U

Table 1
Preliminary Sediment Chemistry Results – Gulfport Turning Basin

	Task		TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012
	Location ID		GP-DU1-COMP	GP-DU2-COMP	GP-DU3-COMP	GP-DU4-COMP	GP-DU5-COMP	GP-DU6-COMP	GP-DU7-COMP	GP-DU8-COMP	GP-DU9-COMP	GP-DU10-COMP	GP-DU10-COMP	RS-GP-C	RS-PAS-A
	Sample ID		GP-DU1-COMP	GP-DU2-COMP	GP-DU3-COMP	GP-DU4-COMP	GP-DU5-COMP	GP-DU6-COMP	GP-DU7-COMP	GP-DU8-COMP	GP-DU9-COMP	GP-DU10-COMP	GP-DU10-COMP-A	RS-GP-C	RS-PAS-A
	Sample Date		12/1/2012	11/30/2012	11/30/2012	11/29/2012	11/28/2012	11/27/2012	11/28/2012	11/26/2012	11/25/2012	11/24/2012	11/24/2012	11/30/2012	11/30/2012
	Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N
	X		Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	979956.2884	1010059.425
	Y		Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	218163.4691	249291.1779
	ERL	ERM													
Pesticides (µg/kg)															
4,4'-DDD (p,p'-DDD)	2	20	0.7 U	0.66 U	0.61 U	0.77 U	0.79 U	0.75 U	0.76 U	0.66 U	0.78 U	0.63 U	--	0.94 U	1.1 U
4,4'-DDE (p,p'-DDE)	2.2	27	0.62 U	0.58 U	0.54 U	0.68 U	0.7 U	0.66 U	0.67 U	0.58 U	0.69 U	0.56 U	--	0.83 U	0.95 U
4,4'-DDT (p,p'-DDT)	1	7	1.1 U*	1 U	0.97 U	1.2 U*	1.3 U*	1.2 U*	1.2 U*	1 U	1.2 U*	1 U	--	1.5 U*	1.7 U*
Aldrin	--	--	0.6 U	0.56 U	0.52 U	0.66 U	0.67 U	0.64 U	0.65 U	0.56 U	0.67 U	0.54 U	--	0.8 U	0.92 U
Chlordane	0.5	6	3.1 U*	2.9 U*	2.7 U*	3.4 U*	3.5 U*	3.3 U*	3.4 U*	2.9 U*	3.4 U*	2.8 U*	--	4.2 U*	4.7 U*
Chlordane, alpha- (cis-Chlordane)	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Chlordane, gamma-	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Dieldrin	0.02	8	0.88 U*	0.83 U*	0.77 U*	0.98 U*	1 U*	0.94 U*	0.97 U*	0.83 U*	0.99 U*	0.8 U*	--	1.2 U*	1.4 U*
Endosulfan sulfate	--	--	0.7 U	0.66 U	0.61 U	0.77 U	0.79 U	0.75 U	0.76 U	0.66 U	0.78 U	0.63 U	--	0.94 U	1.1 U
Endosulfan-alpha (I)	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Endosulfan-beta (II)	--	--	0.8 U	0.75 U	0.7 U	0.89 U	0.91 U	0.85 U	0.88 U	0.75 U	0.9 U	0.73 U	--	1.1 U	1.2 U
Endrin	--	--	0.78 U	0.73 U	0.68 U	0.87 U	0.88 U	0.83 U	0.85 U	0.73 U	0.87 U	0.71 U	--	1.1 U	1.2 U
Endrin aldehyde	--	--	0.78 U	0.73 U	0.68 U	0.87 U	0.88 U	0.83 U	0.85 U	0.73 U	0.87 U	0.71 U	--	1.1 U	1.2 U
Endrin ketone	--	--	0.62 U	0.58 U	0.54 U	0.68 U	0.7 U	0.66 U	0.67 U	0.58 U	0.69 U	0.56 U	--	0.83 U	0.95 U
Heptachlor	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Heptachlor epoxide	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Hexachlorocyclohexane, alpha (BHC)	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Hexachlorocyclohexane, beta- (BHC)	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Hexachlorocyclohexane, delta (BHC)	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Hexachlorocyclohexane, gamma- (BHC) (Lindane)	--	--	0.88 U	0.83 U	0.77 U	0.98 U	1 U	0.94 U	0.97 U	0.83 U	0.99 U	0.8 U	--	1.2 U	1.4 U
Methoxychlor	--	--	4.5 U	4.2 U	3.9 U	5 U	5.1 U	4.8 U	4.9 U	4.2 U	5.1 U	4.1 U	--	6.1 U	7 U
Toxaphene	--	--	23 U	21 U	20 U	25 U	26 U	24 U	25 U	21 U	25 U	21 U	--	30 U	35 U
Total DDx (U = 0)	1.58	46.1	1.1 U	1 U	0.97 U	1.2 U	1.3 U	1.2 U	1.2 U	1 U	1.2 U	1 U	--	1.5 U	1.7 U*
PCB Congeners (ng/kg)															
PCB-008	--	--	1000 J	740 J	630 J	580 J	480 J	190 U	200 U	380 J	200 U	160 U	--	240 U	2600 J
PCB-018	--	--	150 U	140 U	130 U	170 U	170 U	160 U	170 U	140 U	170 U	140 U	--	200 U	230 U
PCB-028	--	--	220 U	200 U	180 U	240 U	870 J	760 J	1100 J	550 J	580 J	200 U	--	290 U	330 U
PCB-044	--	--	130 U	120 U	110 U	150 U	150 U	140 U	810 J	130 U	150 U	120 U	--	180 U	200 U
PCB-049	--	--	150 U	140 U	130 U	170 U	170 U	160 U	160 U	140 U	170 U	140 U	--	200 U	220 U
PCB-052	--	--	330 U	310 U	280 U	370 U	380 U	360 U	1800 J	310 U	380 U	300 U	--	440 U	500 U
PCB-066	--	--	340 U	320 U	290 U	380 U	900 J	920 J	1300 J	820 J	830 J	310 U	--	460 U	520 U
PCB-077	--	--	400 U	380 U	350 U	450 U	460 U	430 U	450 U	380 U	460 U	370 U	--	540 U	610 U
PCB-087	--	--	130 U	120 U	110 U	140 U	140 U	140 U	140 U	120 U	140 U	120 U	--	170 U	190 U
PCB-101	--	--	130 U	120 U	110 U	140 U	140 U	130 U	140 U	420 J	140 U	110 U	--	170 U	190 U
PCB-105	--	--	360 U	340 U	310 U	400 U	410 U	390 U	400 U	340 U	410 U	330 U	--	480 U	540 U
PCB-118	--	--	300 U	280 U	260 U	340 U	340 U	320 U	330 U	290 U	340 U	280 U	--	400 U	450 U
PCB-126	--	--	380 U	350 U	320 U	420 U	430 U	410 U	420 U	360 U	430 U	350 U	--	500 U	570 U
PCB-128	--	--	150 U	140 U	120 U	160 U	170 U	160 U	160 U	140 U	170 U	130 U	--	190 U	220 U
PCB-138	--	--	180 U	170 U	160 U	200 U	210 U	200 U	200 U	170 U	210 U	170 U	--	240 U	280 U
PCB-153	--	--	280 U	260 U	240 U	310 U	320 U	300 U	310 U	270 U	320 U	260 U	--	370 U	420 U
PCB-156	--	--	300 U	280 U	250 U	330 U	340 U	320 U	330 U	280 U	340 U	270 U	--	400 U	450 U
PCB-169	--	--	260 U	240 U	220 U	290 U	290 U	280 U	280 U	240 U	290 U	230 U	--	340 U	390 U
PCB-170	--	--	280 U	260 U	240 U	310 U	320 U	300 U	310 U	270 U	320 U	260 U	--	370 U	420 U
PCB-180	--	--	310 U	290 U	260 U	350 U	350 U	330 U	340 U	290 U	350 U	280 U	--	410 U	470 U
PCB-183	--	--	210 U	200 U	180 U	240 U	240 U	230 U	230 U	200 U	240 U	190 U	--	280 U	320 U
PCB-184	--	--	190 U	180 U	170 U	220 U	220 U	210 U	210 U	180 U	220 U	180 U	--	260 U	290 U
PCB-187	--	--	190 U	170 U	160 U	210 U	210 U	200 U	200 U	180 U	210 U	170 U	--	250 U	280 U
PCB-195	--	--	240 U	220 U	200 U	270 U	270 U	260 U	260 U	230 U	270 U	220 U	--	320 U	360 U
PCB-206	--	--	130 U	120 U	110 U	150 U	150 U	140 U	150 U	130 U	150 U	120 U	--	180 U	200 U
PCB-209	--	--	300 U	280 U	250 U	330 U	340 U	320 U	330 U	280 U	340 U	270 U	--	400 U	450 U

Table 1
Preliminary Sediment Chemistry Results – Gulfport Turning Basin

Task			TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	TurnBasinSed2012	
Location ID			GP-DU1-COMP	GP-DU2-COMP	GP-DU3-COMP	GP-DU4-COMP	GP-DU5-COMP	GP-DU6-COMP	GP-DU7-COMP	GP-DU8-COMP	GP-DU9-COMP	GP-DU10-COMP	GP-DU10-COMP	RS-GP-C	RS-PAS-A
Sample ID			GP-DU1-COMP	GP-DU2-COMP	GP-DU3-COMP	GP-DU4-COMP	GP-DU5-COMP	GP-DU6-COMP	GP-DU7-COMP	GP-DU8-COMP	GP-DU9-COMP	GP-DU10-COMP	GP-DU10-COMP-A	RS-GP-C	RS-PAS-A
Sample Date			12/1/2012	11/30/2012	11/30/2012	11/29/2012	11/28/2012	11/27/2012	11/28/2012	11/26/2012	11/25/2012	11/24/2012	11/24/2012	11/30/2012	11/30/2012
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N	N
X			Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	979956.2884	1010059.425
Y			Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	218163.4691	249291.1779
	ERL	ERM													
Total PCB Congener (U = 1/2)	--	--	4020 J	3555 J	3200 J	3950 J	5360 J	4720 J	7870 J	4705 J	4620 J	370 U	--	540 U	7150 J
Total PCB Congener (U = 0)	--	--	1000 J	740 J	630 J	580 J	2250 J	1680 J	5010 J	2170 J	1410 J	370 U	--	540 U	2600 J
Total Petroleum Hydrocarbons (mg/kg)															
Diesel range organics (C10 - C28)	--	--	3.5 U	3.2 U	3 U	3.9 U	3.9 U	3.7 U	3.8 U	3.3 U	3.9 U	7.3 J	--	11 J	5.3 U
Oil Range Organics (C28-C40)	--	--	3.5 U	3.2 U	3 U	3.9 U	3.9 U	3.7 U	3.8 U	3.3 U	3.9 U	3.2 U	--	4.7 U	5.3 U

Notes:

Detected concentration is greater than ERL (effects range - low) screening level

Detected concentration is greater than ERM (effects range - median) screening level

Bold = Detected result

-- = not reported or not applicable

J = Estimated value

U = Compound analyzed, but not detected above detection limit

All non-detect results are reported at the **method detection limit**.

* Results marked with an asterisk (*) are non-detect results that exceed the ERL screening level.

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Total PAH (17) is the total of 2-Methylnapthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(x)fluoranthenes, Benzo(a)pyrene, Benzo(g,h,i)perylene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-c,d)pyrene, Naphthalene, Phenanthrene, and Pyrene.

Total DDx consists of the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT if measured.

Total PCB congeners is the total of all PCB congeners listed in this table.

Table 2
Preliminary Summary of Bioassay Test Results - Gulfport Turning Basin

	SOLID PHASE				SUSPENDED PARTICULATE PHASE					
	Amphipod	Survival (%) ¹	Polychaete	Survival (%)	Bivalve	LC ₅₀ (%)	Mysid	LC ₅₀ (%)	Fish	LC ₅₀ (%)
CONTROL		94		100	NA		NA		NA	
CONTROL		97		100						
REFERENCE (Gulfport)		84		96						
REFERENCE (Pascagoula)		71		100						
GP-DU1	FAIL	48	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU2	PASS	66	PASS	94	PASS	>100	PASS	>100	PASS	>100
GP-DU3	PASS	73	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU4	FAIL	61	PASS	98	PASS	>100	PASS	>100	PASS	>100
GP-DU5	PASS	76	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU6	PASS	69	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU7	PASS	83	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU8	FAIL	47	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU9	PASS	80	PASS	100	PASS	>100	PASS	>100	PASS	>100
GP-DU10	FAIL	63	PASS	100	PASS	>100	PASS	>100	PASS	>100

 Minimum survival in reference must be 73%

¹ Amphipod survival compared to Gulfport Reference


 SP tests run in two groups. Group 2 results are hatched.

Table 3
Preliminary Results - Amphipod Solid Phase Bioassay Test - Gulfport Turning Basin

Leptocheirus Group 1		Number Surviving	Percent Survival	Mean Survival		Leptocheirus Group 2		Number Surviving	Percent Survival	Mean Survival
Control	REP 1	20	100	97		Control	REP 1	20	100	94
	REP 2	19	95				REP 2	20	100	
	REP 3	18	90				REP 3	20	100	
	REP 4	20	100				REP 4	16	80	
	REP 5	20	100				REP 5	18	90	
RS-PAS-A	REP 1	16	80	71		RS-GP-L	REP 1	16	80	84
	REP 2	15	75				REP 2	18	90	
	REP 3	12	60				REP 3	18	90	
	REP 4	14	70				REP 4	16	80	
	REP 5	14	70				REP 5	16	80	
GP-DU5	REP 1	17	85	76		GP-DU1	REP 1	11	55	48
	REP 2	14	70				REP 2	9	45	
	REP 3	16	80				REP 3	8	40	
	REP 4	15	75				REP 4	9	45	
	REP 5	14	70				REP 5	11	55	
GP-DU6	REP 1	14	70	69		GP-DU2	REP 1	12	60	66
	REP 2	16	80				REP 2	14	70	
	REP 3	13	65				REP 3	12	60	
	REP 4	14	70				REP 4	14	70	
	REP 5	12	60				REP 5	14	70	
GP-DU7	REP 1	14	70	83		GP-DU3	REP 1	14	70	72
	REP 2	17	85				REP 2	14	70	
	REP 3	20	100				REP 3	14	70	
	REP 4	17	85				REP 4	16	80	
	REP 5	15	75				REP 5	14	70	
GP-DU8	REP 1	9	45	47		GP-GU4	REP 1	12	60	61
	REP 2	10	50				REP 2	12	60	
	REP 3	7	35				REP 3	11	55	
	REP 4	11	55				REP 4	12	60	
	REP 5	10	50				REP 5	14	70	
GP-DU9	REP 1	16	80	80		GP-DU10	REP 1	12	60	63
	REP 2	14	70				REP 2	11	55	
	REP 3	18	90				REP 3	14	70	
	REP 4	17	85				REP 4	14	70	
	REP 5	15	75				REP 5	12	60	



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MEMORANDUM

To:	Doug Johnson, U.S. Environmental Protection Agency, Region 4	Date:	November 27, 2012
From:	Andrew Martin and Wendell Mears Anchor QEA, LLC	Project:	100657-01.12
Re:	Gulfport Turning Basin – Dredge Unit 10 Compositing Scheme		

INTRODUCTION

Anchor QEA, LLC initiated sediment sampling activities within the proposed Gulfport Turning Basin footprint on November 24, 2012. Sediment sampling began in the southernmost dredge unit, GP-DU10. At two of the three sampling stations within GP-DU10 (GP-DU10-01 and GP-DU10-02), cores were stratified and consisted of an approximately 4- to 5-foot medium-grained sand layer. At GP-DU10-01, this layer occurred between -30 and -35 feet, and at GP-DU10-02, this layer occurred between -32 and -36 feet. The cores above and below the sand layer were predominantly silty clay. No stratification was present at station GP-DU10-03.

As discussed and subsequently updated in the Sampling and Analysis Plan, if stratification was present, the two layers would be composited and tested separately. As such, the field team ensured that sufficient material from both layers was collected in order to complete all analyses.

OBJECTIVE

Anchor QEA is requesting the U.S. Environmental Protection Agency's (USEPA's) consideration to eliminate or reduce the bioassay and bioaccumulation tests associated with a sand layer observed in GP-DU10 recently sampled at the Gulfport Turning Basin. Due to the depth and physical characteristics of the sand layer, Anchor QEA does not anticipate this layer to contain contaminants at levels that may cause adverse biological impacts.

The following options are proposed in order of preference (most preferred presented first):

1. Submit sand layer for quick-turn sediment chemistry. Evaluate sediment chemistry of sand layer. If sand layer sediment chemistry is minimal (predominantly at or less than effects range low [ERL] values), no additional bioassay or bioaccumulation tests are recommended for sand layer. Continue to analyze silty clay layer for all chemistry, bioassay, and bioaccumulation tests as planned.
2. Submit both layers for quick-turn sediment chemistry. Evaluate sediment chemistry of both layers. If chemistry results from both sediment layers are similar, then homogenize both layers together and perform bioassay and bioaccumulation tests as planned.
3. Perform chemistry, bioassay, and bioaccumulation tests as planned on both layers.

Sediment sampling has continued in GP-DU8 and GP-DU9. This sand layer was minimal, if not non-existent, in these adjacent DUs. The field team will continue to evaluate cores collected in the remaining DUs to assess if stratification is present.

SUMMARY

In order to maintain the integrity of the samples (i.e., to meet holding times), we would appreciate the USEPA's immediate attention and consideration of the proposed analytical approach to the sand layer encountered in GP-DU10. We are available to discuss this approach at the USEPA's convenience. Andrew Martin can be reached at (949) 334-9630, and Wendell Mears can be reached at (228) 818-9626.

Andy Martin

From: Andy Martin
Sent: Wednesday, November 28, 2012 11:42 AM
To: 'Johnson.Doug@epamail.epa.gov'
Cc: Wendell Mears; 'mcarthur.christopher@epa.gov'
Subject: RE: Gulfport Turning Basin - Dredge Unit 10

Doug,

In my response below, I incorrectly indicated moving forward with the "third option". I meant to write the second option altered as you recommended. In my mind, that became a "new third option". I apologize for any confusion. We will proceed as recommended.

Thank you,

Andrew

Andrew Martin
Managing Environmental Scientist

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From: Andy Martin
Sent: Wednesday, November 28, 2012 11:35 AM
To: 'Johnson.Doug@epamail.epa.gov'
Cc: Wendell Mears; mcarthur.christopher@epa.gov
Subject: RE: Gulfport Turning Basin - Dredge Unit 10

Doug,

We appreciate your quick review and consideration of the testing approach to this sand layer. I understand your approach and we'll move forward with the third option. We will archive sufficient material from each layer appropriately as recommended.

Thank you,

Andrew

Andrew Martin

Managing Environmental Scientist

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From: Johnson.Doug@epamail.epa.gov [<mailto:Johnson.Doug@epamail.epa.gov>]

Sent: Wednesday, November 28, 2012 11:28 AM

To: Andy Martin

Cc: Wendell Mears; mcarthur.christopher@epa.gov

Subject: Re: Gulfport Turning Basin - Dredge Unit 10

Andy,

Option 1 is not viable because we cannot use sediment quality guidelines to make regulatory decisions under MPRSA. The sand layer would have to meet the exclusionary criteria in order to not require testing. Option 2 is acceptable, but I don't think necessary. Since the sand layer does not appear to be a significant portion of the total material to be removed, I would recommend retaining sufficient material for each layer in archive (to test separately if needed) and proceeding with homogenizing all 3 layers and testing as one sample. If you end up with a toxicity problem you will want to test all 3 layers separately.

"I think we should treat each other as infinitely complex, where all are capable of very thoughtful ways of being wrong" -- John Gorka

Doug Johnson
Regional Sediment Quality Coordinator/
Dredged Material Evaluation
US Environmental Protection Agency
Sam Nunn Atlanta Federal Center
Wetlands, Coastal, and Ocean Branch,
Coastal and Ocean Protection Section
61 Forsyth Street, S.W.
Atlanta, GA 30303

office: 404-562-9386, fax: 404-562-9343

email: johnson.doug@epa.gov

▼ Andy Martin ---11/27/2012 02:34:17 PM---Good Afternoon Doug, We have encountered a small stratification layer in one of the dredge units bei

From: Andy Martin <amartin@anchorgea.com>
To: Doug Johnson/R4/USEPA/US@EPA
Cc: Wendell Mears <wmears@anchorgea.com>
Date: 11/27/2012 02:34 PM
Subject: Gulfport Turning Basin - Dredge Unit 10

Good Afternoon Doug,

We have encountered a small stratification layer in one of the dredge units being evaluated as part of the Gulfport Turning Basin project. We are requesting the USEPA's consideration in amending the compositing and analytical scheme of this layer. Please refer to the attached memorandum for complete details and proposed analytical scheme.

I am available anytime today to discuss further, as necessary. If you are unable to reach me at my office number (949) 334-9630, please try my cell (760) 443-2402.

Your attention to this matter is greatly appreciated,

Regards,

Andrew

Andrew Martin
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[attachment "Gulfport_DU10 Memo_11 27 12.pdf" deleted by Doug Johnson/R4/USEPA/US]

Andy Martin

From: Andy Martin
Sent: Wednesday, February 13, 2013 6:01 PM
To: Johnson.Doug@epamail.epa.gov
Subject: Gulfport Turning Basin - Bioaccumulation Test Results and Tissue Chemistry Update and Recommendation

Hi Doug,

I tried reaching you a couple times today. Hopefully, we can touch base first thing in the morning tomorrow. I'm available 7am to 9am Pacific time.

The bioaccumulation tests were completed. All tests passed with the exception of *Macoma* treatments DU1 (mean = 60%; range = 50 to 87.5%) and DU4 (mean = 70%; range = 62.5 to 75%) and *Nereis* treatments DU7 (mean = 72%; range = 60 to 80%) and DU10 (mean = 28%; range = 0 to 80%). Neither of these four treatments met the 75% survival criteria listed in SERIM and SAP. In addition, *Nereis* treatment for the reference sample RS-GP-L didn't meet the criteria of at least 90% survival.

DU1, DU4 and DU10 were also the same project sediments that we reran the amphipod SP test. It's likely the grain size and TOC were contributing factors to low survival in the bioaccumulation test as well.

The lab does have sufficient tissue to perform the analytical chemistry, with the exception of DU10 Reps 1-3 which had 0 survival.

We're proposing moving forward with tissue chemistry analyses as planned. Tissue chemistry for DU10 will only have two reps.

Also, TRAC laboratories composited the Day 0 tissues into a single sample, instead of having three replicates. Since these organisms haven't been exposed to project sediment **we can either test a single sample, or split the composited tissue into three at this point and have three samples analyzed. Do you have a suggestion or preference?**

Your thoughts would be appreciated,

Thank you,

Andrew

Andrew Martin
Managing Environmental Scientist

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